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Our Air Force saves valuable forests from annilialation by catastrophic insects.

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Lumber is valuable raw material. It is said about it, figuratively, that it accompanies us from cradle to grave. We need it to build our houses, our factories, our economy; we cannot spare it in the mines, in the construction of railroads, telegraphs, and machines. It is the raw material for our paper, alcohol, artificial silk, and many other materials and needs.

Its quantity in our forests is not unlimited and, therefore, we have to economize very carefully. It does not mature in one year like crops but takes a whole century; and then? Wood grows again only on the wood of trees. The supplies are not only for us but for a few generations; hence, all this care for its supply and continuous delivery. Therefore, the annual planning of wood delivery is so important, so that it could be saved for the future which has to supply our industry and satisfy our whole national economy.

The forest, too, has its enemies in nature which destroy this carefully planned supply. In here belong huge catastrophies of breakages and uprootings, caused by winds, snow and frost, damage through unusual drought, etc. Against these elements we are as a rule helpless in the moment of attack. However, we can destroy, nowadays, as a rule, billions of omnivorous caterpillars, which on huge areas completely eat away tree tops, after which large areas of hopeful new forests wither prematurely. If we discover the danger in time, we can destroy them by chemical means to such an extent that we can limit the losses to a bearable extent and avert a calamity, or slow it down considerably.

We have to bring these chemical insecticides to the tree-tops, and bring them safely on the bodies of the destroying, devouring insects. The farmers, the fruit-growers, and the vine-growers can easily help themselves on small areas with suitable apparatus and machines, such as different ground and portable and movable sprayers. But now about large, often impassable forest areas? It would require many workers and machines and much time, while the insects destroy the young forests quickly. How about today? Everywhere we have a shortage of workers. Right here fast, available planes with brave pilots will help us. They, too, have helped and still will help us.

The protection of agricultural growths and new forests from planes is almost thirty (30) years old. It was started right after World War I. At present, it is done in progressive countries with a fully developed forest growth and with a developed aircraft industry. Right now, we admire the preparedness of Soviet fliers, who rallied in time to check the catastrophic growth of the potato-bug.

This parasite penetrates from the West and is artificially and deliberately brought in from foreign countries, hostile to our popular democratic institutions, to destroy our valuable food supply and our national nourishment. The Soviets bring

us freely the valuable experience of their developed research and agricultural and forest knowledge. We are very grateful to them for it.

In CSR we started with aerial spraying in forestry in 1926 when two (2) planes sprayed 370 acres, and in 1927 three (3) planes sprayed 1,000 acres in OPAVSKE SLEZSKO against the caterpillars on fir trees. Then, in 1932, we have attacked the caterpillars at MALACKY with four (4) planes on 2,200 acres. After World War II, the sprayings were started already in 1948 against insects on 80 acres with one plane in Southern Bohemia and the Silesion Berkyds. In the following year, 1949, already 8,000 acres were sprayed against insects in Bohemia, in Teshin Silesia and Slovakia, including smaller areas, treated against special insects.

In Bohemia and Slovakia

There, in May and June, already twenty (20) planes were operative from heavy types to light, mobile CAP's (STORKS) which have proved themselves in mountainous terrain. The action was taken in five places, spaced considerably apart. The trained military Air Force of 1949 could, in 1950 - in the short period from the end of May and beginning of June - organizationally handle smaller areas, about 1,200 acres with half the number of planes of both types. In numerous, scattered focal points, there were dangerous larvas on fir trees in the vicinity of Prague, Vyskov, Prostejov, Olomonc on the Drahan Plateau, and lesser concentrations at Zilina and Silesne on the Polish frontier.

For the first time in the summer of 1949 our agriculturists tried to use planes against pests on the sugar beet fields near Prague. During the experiment they used one helicopter, and then a "CAP" plane, the type used for forest sprayings, joined the action.

It was an important development for our agriculture, when this branch of our agriculture joined progressively the protection of our forests. In 1950, our agriculture readily used the experience gained in spraying woods, fighting the pests on infested forest edges during their springtime aggregation, as well as the protection of adjacent agricultural growths against insects near Zuojmo and Kromeriz. Then, on July 21, Soviet fliers and experts in spraying of the potato bug came, and so this aerial protection of forests and fields became the foremost acknowledged method in both our forestry and agriculture.

The success of aerial action necessitates much preparatory work of an extended collective action, joined by friendly labor. Here, this work was made possible primarily by the Defense Ministry's full understanding of our woods. The Defense Ministry fully joined the action by furnishing planes and fliers. The Air Research Institute, together with the Research Institute for the Protection of Woods, built prototypes of sprayers. Our industry hastily built those sprayers. The Ministry of Agriculture with national and non-national woods took initiative in organizing protective actions. Research institutes for the protection of woods initiated this action along expert-scientific lines and cooperated diligently during all actions.

The success of the action lies, naturally, in the effectiveness of the protective materials, the insecticides. Our first sprayings counted with intestinal arsenic poisons and less often with some alkaloids. From 1938 we have used a compound called Gerasal, based on the well-known DDT, which is non-poisonous for men, mammals and other vertebrates, and effective against insects.

No less important is the proficiency and bravery of the pilots. They often flew a few (5-10) meters over the tree-tops, so as to deposit the powder there, in the woods, often over uneven terrain and trees of different heights. We had ample opportunity to admire the low passes of our pilots and their dexterity in changes of terrain and weather difficulties.

The bravery and skill of the pilots is not sufficient, however; it is necessary to achieve complete cooperation between the pilots and the ground organization for spraying and observation of the action. It is, primarily necessary to achieve the closest and most economical contact of the powder with the devouring caterpillars. This depends considerably on the nature of the aerial distance between the plane-sprayer and the caterpillars in the treetops. Therefore, the sprayed forest areas were divided into narrow, rectangular strips by signals, easily visible to the pilots, (wooden, cloth targets, and hydrogen balloons). In these strips the plane, with repeated passes, lay one powder belt close to another to cover the endangered area evenly with insecticide.

The descent of the powder into the tree tops is determined mostly by weather. Most favorable for the action is the calm air at sunrise and sunset or during quiet cloudy days, when it is possible to spray, all day long. During hot, sunny days, rising air currects are formed, which carry the powder high into the air. Also during windy weather the insecticide usually misses the treetops. Only during exceptionally favorable conditions is it possible to make use of a gentle breeze, if it is guaranteed that the plane flying at right angle to the wind direction carries the insecticide into the tree tops. The powder then penetrates the tree top layer along a greater distance. Otherwise, the sprayed belts in calm air are, usually 10-15 meters wide, depending on the sprayer, and the planes lay them sideways. Planes are often - wherever possible - directed to and from the sprayed fields by additional canvas signals, visible to pilots or by balloons held by one or two people in the treated forest areas and well visible from the plane, such as on large meadows or forest edges like fields, etc.

The plane enters over this signal and returns over it, while the signal has been shifted to the width of the sprayed field. One or more planes following each other are used. In the undergrowth, observers and experts follow the foggy penetration of the insecticide in and under the tree tops, note the dropping of caterpillars and catch their excretions after the spraying, on certain flat pieces of paper, cloth or ground to find out the effectiveness of the spraying. During a very successful attack in 1949, two or three to four thousand caterpillars dropped on a $1m^2$ area under the treetops. This was a destruction of a colony of billions of caterpillars on extended areas.

It often happens that in spite of the best efforts of the pilot and due to an optical illusion of top or side observation, the powder does not even fall on the treetops, at least not on the desired spot. Often, again a very rarefied powder reaches the growth, and is mildly effective. In those cases, it is necessary to interrupt the spraying and to wait for favorable weather conditions. If, in spite of it, the spraying is continued, many failures result, and necessitate a repetition of the spraying during favorable conditions.

Contact with pilots was maintained in 1949-1950 by radio cars connected with a suitable observation network in the undergrowth and outside of it. This was often extended by telephone connections, where communications with the signal men guiding

4

incoming and outgoing planes in the sprayed field is of considerable importance.

The effectiveness of the planes was determined by their load, their distance from the airport, and the weather. In 1949-50 more powerful planes carried about 600 kilograms, and less powerful planes carried about 150-200 kilograms of insecticides. For the lighter CAP planes a provisional airfield was used; for heavier ones the normal airfields. By using 30-50 kilograms of insecticides for one acre, up to 50 acres daily were sprayed by one heavy-type plane. During cloudy, favorable days, with all-day flights, up to two or three times as much were sprayed. During unfavorable, windy, and rainy weather, there is no spraying for a few days of a solitary flight is made, and then the efficiency drops considerably. The outlook for the future -- compared with the present development of spraying and its results here and abroad -- is very good. A further perfection of sprayers is expected in the near future, by using not only spraying but also atomizing forests with insecticides. There is an effort to introduce a suitable helicopter into the action here, as has been done abroad, especially where there are more small focal points on mountainous or steep terrain, and for an economical flight directly from the place in the immediate vicinity of the endangered area.

Mankind's fight for a successful, early conquest of insect calamities in nature is an intense, hard, and tiring one, but it gives promise of being successful.

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